Climate of the Past Discussions

Clim. Past Discuss., referee comment RC2
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Comment on cp-2022-13

Anonymous Referee #2

Referee comment on "Ring-width and blue-light chronologies of *Podocarpus lawrencei* from southeastern mainland Australia reveal a regional climate signal" by Jacinda A. O'Connor et al., Clim. Past Discuss., https://doi.org/10.5194/cp-2022-13-RC2, 2022

June 2022

Review of "Piloting novel multi-centennial palaeoclimate records from mainland southeast Australia" by O'Connor *et al*.

Manuscript ID: cp-2022-13

This paper reports an interesting and important dendroclimatological case study from southeast Australia. It demonstrates strong relationships between ring width and blue intensity chronologies and a selection of climate parameters for a rarely-studied conifer - *Podocarpus lawrencei Hook.f* - for the 20th-century. The manuscript is engaging in terms of scientific content and the writing style is generally clear, although there is scope to rectify some ambiguities in the text. It works well as a pilot study although, as outlined in my comments below, the authors could make a stronger case for its novelty, given this word is used in the current title but similar papers are cited. The careful pre-treatment method evaluation is a useful contribution and the statistical treatment and analysis seems well-executed and convincing, for the most part. I have a number of generally minor comments, listed in order of appearance in the manuscript:

Comments

Title: I don't find the title particularly illuminating; it feels rather vague and not wholly accurate, in my opinion. I think more keywords from the abstract could be woven into the

title. At the very least, I suggest making clear in the title that this is a dendro-based study on a new conifer species. Furthermore, this particular study does not report a "multi-centennial record".

Line 21: could you state in this sentence how far back in time the observations and gridded data extend?

Lines 51-53: I suggest expanding on this key point around limited progress in Australian dendroclimatology as this is critical justification for your research and will better accommodate the broad audience of the journal.

Lines 57-58 and 65-71: The paucity of long-term reconstructions and the benefits of high elevation areas are emphasised but some commentary on the representativeness of alpine climate reconstructions for the wider region would be useful.

Line 112-119: I have modest experience of dendroclimatology but, with that caveat in mind, nine specimens feels rather limited. I suggest some justification (how does this compare to similar case studies like McDougall et al. 2012 and Brookhouse & Graham 2016?) and critical reflection on the appropriateness of this sampling strategy and any limitations this may introduce would be useful at this stage.

Second, could the authors clarify the method(s) used to physically obtain the cross-sections? Were these sliced out of the trunk or did they study stumps? Or did they repeat the approach outlined on Lines 76-77 from McDougall et al. 2012? I'm guessing the latter but this should be made clear in the Methods section.

Lines 140, 151, and elsewhere: The authors repeatedly highlight the highly lobate radial growth of *P. lawrencei*. I – and I suspect other readers – would find a photo of one of the cross-sections very useful.

Lines 182 – 185: I suggest providing a bit more technical detail on the gridded climate data, especially the temporal and spatial scale of those datasets.

Lines 195-196: I'm a little surprised that these two dendrochronological studies (McDougall et al. 2012 and Brookhouse & Graham 2016) are not cited in the introduction. Given the important claims made in this paper about novelty, being more transparent about what research has already been conducted and how your study builds upon existing work is important. The point about developing a strong network (Lines 199-200) is valid but this secondary aim could be stated earlier in the paper.

Results and Discussion: Whilst I appreciate the focus of this paper is testing for climate signals, I'm surprised more detailed reporting of the cross-dating and chronological development is not presented. The full chronology is shown on Figure 5 but minimal corresponding text is presented in Section 3. The authors state on Line 94 that specimen ages range from 67 to 327 years – this could be elaborated upon, especially to provide deeper justification for your decision to start the analysis from 1929 due to "low sample resolution" Line 169.

Similarly, given the analysis is on 20th-century reconstructions, a refined Figure 5 focusing on only that time window would be useful, perhaps as a second panel. In its current form, statements like Lines 206-207 "particularly narrow rings observed in the 1905s and 60s" are tricky to pick out by eye.

Lines 228-244: I found this analysis to be fascinating! I know little about this species but Te justification for a strong relationship between winter temperature and RW presented in this segment is convincing.

Figures

Figure 1 appears rather blurry on my screen. This can be easily rectified but I felt worth flagging with the authors.

Figure 5: In addition to the comments above about the data plotted in this figure and the figure itself, it's not clear how the standard errors have been visualised on the top panel? I'm also unclear what the y-axis label on the bottom panel refers to – what is "sample depth"?

Figure 7: could you clarify in the caption which parameter is represented by the green and grey bars?